

***Kunzea dracopetrensis* (Myrtaceae: Leptospermeae), an uncommon new species from Western Australia's south-eastern wheatbelt**

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SHORT COMMUNICATION

Many new species discovered by botanists in Western Australia are not recognised as different in the field but from within an herbarium's existing collection during the curation or study of specimens. *Kunzea dracopetrensis* R. Butcher, the new species described herein, is one such species. It was identified as new during curation of the Western Australian Herbarium's *Kunzea* Rchb. collection while expediting the publication of three new Threatened taxa from the Ravensthorpe region (Toelken & Craig 2007) as part of the Western Australian Government's *Saving Our Species* special edition of *Nuytsia* (Vol. 17). Two distinctive and morphologically congruent specimens (*A.M. Coates* 3107; *K. Kershaw* KK 2184) were identified from two nearby localities within Dragon Rocks Nature Reserve, c. 35 km north of Newdegate in the south-eastern wheatbelt region; one specimen was retrieved from within the extensive *K. preissiana* Schauer collection, while the other had been recognised as unusual and languished in the "*Kunzea* sp." folder. The phrase name *K. sp.* Dragon Rocks (*K. Kershaw* KK 2184) was subsequently erected on Western Australia's vascular plant census, and the taxon added to the State's conservation list. To date, no populations have been located outside this reserve.

Kunzea dracopetrensis* R. Butcher, *sp. nov.

Type: Dragon Rocks Nature Reserve, Western Australia [precise locality withheld for conservation reasons], 5 October 2007, *R. Butcher & J.A. Wege* RB 1193 (*holo:* PERTH 08023778; *iso:* AD, AK, CANB, K, MEL, NSW).

Kunzea sp. Dragon Rocks (*K. Kershaw* KK 2184), Western Australian Herbarium, in *FloraBase*, <https://florabase.dpaw.wa.gov.au/> [accessed 30 May 2019].

Erect, spreading, greyish *shrubs* c. 1.5–2 m high, to 3 m wide, with a few stems from base, each densely covered with many short, branched, lateral branches, the inflorescence-bearing stems elongate, held above the mostly vegetative branches; *young branches* with decurrent flanges on long shoots, indumentum sparsely to moderately dense, hairs loosely appressed, wavy, white-grey, somewhat tangled; *early bark* pale grey, splitting to show cream-tan layer beneath. *Leaves* alternate; *petiole* 0.2–1.5 (–1.9) mm long, antrorse then spreading at c. 45° from the stem; *lamina* thick, narrowly obovate, elliptic or broadly elliptic, 0.9–4.1 × 0.7–1.5 mm, apex broadly obtuse to rounded, base abruptly constricted

into petiole, adaxial surface flat to slightly concave, abaxial surface gently convex to sub-keeled near apex with an obscure to slightly raised midvein, other veins obscure, both surfaces with moderately dense indumentum of wavy, white-grey, somewhat tangled hairs 0.5–0.8 mm long, some older leaves glabrescent. *Inflorescence* a botryum with 1–3 sessile flowers, terminal mainly on short shoots, with vegetative growth continuing from the terminal bud post-flowering (vegetative buds also observed in axils of perules below the infructescence); *perules* usually 6 or 7, shape variable, the lowest deltoid to broadly depressed-ovate with acute to acuminate apex, transitioning into broadly depressed-obovate to quadrate-orbicular with broadly rounded and shortly muricate apex, $1.3\text{--}1.7 \times 1\text{--}1.6$ mm, chartaceous, 1–5 veins visible, indumentum variable with each successive perule becoming less hairy, the lowest with wavy hairs in a broad band along midline and at apex, with wavy-ciliate margin, transitioning to subglabrous, with an apical tuft of wavy hairs and cilia only on apical margin, persistent; *bracts* golden brown, slightly glossy, clasping and covering hypanthium, variable in shape, transitioning from depressed-broadly obovate with a broadly rounded apex to broadly obovate with a broadly emarginate, muricate apex, $2.7\text{--}3.8 \times 2.8\text{--}3.6$ mm, chartaceous, with 5 veins from base, glabrous with wavy-ciliate margin in upper 3/4 to 1/4, persistent; *bracteoles* paired, narrowly elliptic to oblanceolate, curved along length, apex acute to acuminate, $1.5\text{--}2.5 \times 0.6\text{--}1.3$ mm, veins indistinct or midvein visible, long wavy hairs along midline, at apex and on margin, persistent. *Hypanthium* with prominent rim, 2.6–3.6 mm long when flowering (free tube 1.4–2 mm long), glabrous outside with a few long hairs covering base from the point of attachment to the stem. *Calyx lobes* ovate to deltoid, 1.3–1.7 mm long, apex obtuse but appearing acute because of shortly and strongly incurved apex (c. 90°) and incurved margins, thickened and shortly ridged dorsally near apex, margins submembranous, glabrous inside and outside. *Corolla lobes* depressed-broadly ovate to suborbicular, very shortly and broadly clawed, $2.1\text{--}3.2 \times 2.4\text{--}3.3$ mm, bright pink, darker towards edges on dried material, margins entire. *Stamens* 15–20, in apparently 1 row but with clusters of minute villi (staminodes?) on hypanthium rim in front of petals suggesting a second row; *filaments* 1.7–3.7 mm long (slightly shorter than to $1.5 \times$ length of corolla lobes); *anthers* broadly ovate, 0.4–0.7 mm long, with a small, tuberculate connective gland. *Ovary* 5-locular, style base slightly sunk into upper surface; *placenta* narrowly elliptic to elliptic, the 2 lobes $\pm$ connate, peltately attached near the apex of the locule wall, with 1 row of ovules per lobe; *ovules* 12–15 per locule, $\pm$ equal, oriented horizontally with lower ones pendulous and a little larger; *style* 4.8–6.2 mm long, base slightly broader, tapering towards apex; *stigma* capitate, distinctly papillose, much broader than style, not centrally depressed. *Fruit* a tan, elongate-urceolate capsule, with a darker brown circumferential band 0.8–1 mm wide towards the apex, 2.4–2.8 mm long, with 5 persistent, erect to widely spreading, incurved, dorsally thickened calyx lobes. *Seeds* ovate in outline, $\pm$ trigonous with a curved outer face, 0.9–1 mm long, epidermal cells regularly arranged in longitudinal rows on outer face with those on the lateral faces in $\pm$ concentric bands. (Figure 1)

Diagnostic features. Distinguished from other species of *Kunzea* by the following combination of characters: greyish shrubs c. 1.5–2 m high, to 3 m wide, with bright pink flowers on upper branches; obovate to broadly elliptic leaves with wavy, somewhat tangled hairs 0.5–0.8 mm long on both surfaces; 1–3-flowered inflorescences; glabrous hypanthium and calyx lobes; the hypanthium enclosed by slightly glossy, golden brown, depressed-obovate to broadly obovate, $\pm$ glabrous bracts with broadly emarginate apex and ciliate margin only near apex; narrowly elliptic to oblanceolate bracteoles c. 1/2 bract length and with long wavy hairs; 15–20 stamens, shorter than or just exceeding corolla lobes; style 4.8–6.2 mm long with broad, capitate, papillose stigma.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 7 Oct. 1991, A.M. Coates 3107 (PERTH); 19 Nov. 2007, T.E. Erickson TEE 232 (PERTH); 3 Oct. 2000, K. Kershaw KK 2184 (PERTH).



Figure 1. *Kunzea dracopetrensis*. A – shrub *in situ* in Dragon Rocks Nature Reserve showing inflorescence-bearing branches held above greyish foliage, as well as habitat; B – pair of 1-flowered, terminal inflorescences showing thick, elliptic leaves with wavy, white-grey hairs on both surfaces and the hypanthium completely covered by slightly glossy, golden brown bracts with ciliate margins, and long style with capitate, papillose stigma; C – bright pink flowers from top showing few stamens per flower, these scarcely differentiated into two rows. Photographs by R. Butcher (A) and R. Davis (B, C).

Distribution and habitat. Currently known only from Dragon Rocks Nature Reserve, c. 310 km east-south-east of Perth, in the Western Mallee sub-bioregion. This 322 km² reserve is surrounded by farmland on all sides and contains a number of different wheatbelt vegetation communities in a complex mosaic. Within the reserve *K. dracopetrensis* occurs in white-grey sandy clay over laterite, or downslope from granite, in species-rich heathland with sparse mallees (Figure 1A). Associated species

include *Calytrix leschenaultii*, *Eucalyptus albida*, *Hakea incrassata*, *Isopogon teretifolia*, *Melaleuca uncinata*, *Petrophile seminuda*, *Santalum acuminatum*, *Stackhousia monogyna*, *Verticordia chrysantha* and species of *Allocasuarina*, *Baeckea*, *Borya*, *Calothamnus* and *Leptospermum*.

Phenology. Spring-flowering, with flowers observed in early October and fruits collected in November.

Etymology. Named for its occurrence in Dragon Rocks Nature Reserve (L. *draco*, dragon; *petrensis*, among rocks).

Vernacular name. Dragon Rocks Kunzea.

Conservation status. Listed as Priority Two under Conservation Codes for Western Australian Flora, under the name *K. sp.* Dragon Rocks (K. Kershaw KK 2184) (Smith & Jones 2018). It is highly unusual for so few collections to have been made of such a large, showy shrub and for the first (known) of these to have been made as late as 1991. This species does not occupy a particularly unique habitat and given the scale of sandplain land clearing in the wheatbelt, it is likely that it was more widespread and has undergone a significant range contraction commensurate with the loss of native vegetation in the area. *Kunzea dracopetrensis* may warrant listing as Threatened pending comprehensive survey and reassessment.

Affinities. Recent molecular phylogenetic analyses (O'Brien *et al.* 2000; de Lange *et al.* 2010) have resulted in significant changes in the infrageneric classification of *Kunzea*, which is now recognised as having four subgenera (de Lange *et al.* 2010) – *Kunzea*, *Niviferae* Toelken & de Lange, *Salisia* (Lindl.) Toelken & de Lange, and *Angasomyrtus* (Trudgen & Keighery) de Lange & Toelken. The latter two subgenera are endemic to Western Australia; subg. *Angasomyrtus* being monotypic *viz.* *K. saligna* (Trudgen & Keighery) de Lange & Toelken, and subg. *Salisia* containing three sections – *Salisia* (Lindl.) Benth., *Zeamuk* Toelken, and *Floridae* (Toelken) Toelken & de Lange. Based on rDNA sequences (de Lange *et al.* 2010), the three subsections recognised by Toelken (1996) within sect. *Zeamuk* no longer stand; subsect. *Floridae* Toelken is now elevated to section rank and subsects. *Arborescentes* Toelken and *Globosae* Toelken have been subsumed into sect. *Zeamuk* (de Lange *et al.* 2010). While the phylogenetic position of *K. dracopetrensis* is unknown, based on its morphology (e.g. sloughing bark on young growth; few-flowered inflorescences predominantly on short shoots off the main long shoots; flowers large, with pink petals approximately the same length as the stamens etc.) as well as its habitat and distribution (e.g. low point in landscape in white clayey sand; south-eastern part of south-west Western Australia) it most likely belongs to *K.* subg. *Salisia* sect. *Floridae* (formerly *K.* sect. *Zeamuk* subsect. *Floridae*; Toelken 1996).

Kunzea dracopetrensis is most similar to regional congeners *K. preissiana* and *K. jucunda* Diels & E. Pritz, and shares characters with each. Of the two it is more like *K. jucunda*, with both having elliptic leaves and $\pm$ glabrous, slightly glossy, golden brown bracts, as well as some overlap in flower number per inflorescence and stamen number. It is distinguishable from both by the combination of its thick, elliptic leaves with wavy, somewhat tangled hairs on both surfaces (*K. jucunda*: thick, elliptic and glabrous; *K. preissiana*: thin, usually narrowly oblanceolate to narrowly elliptic with spreading fine hairs), 1–3-flowered inflorescences (*K. jucunda*: (1–)2–4(–6)-flowered; *K. preissiana* (2–)3–7(–12)-flowered), large, subglabrous, marginally ciliate bracts that are as long as the glabrous hypanthium (*K. jucunda*: smaller (1.8–2.2 mm long), glabrous or marginally ciliate bracts that are c. 1/2–2/3 the length of the glabrous hypanthium; *K. preissiana*: large (2.2–3.8 mm long), hairy bracts that are nearly as long as the hairy hypanthium), and fewer (15–20) stamens (*K. jucunda*: 18–24; *K. preissiana*: 18–32).

The distinctive bracts of *K. dracopetrensis* are similar to those of *K. montana* (Diels) Domin in *K.* subgen. *Salisia* sect. *Zeamuk*; however, this species can be readily distinguished by its dense heads of cream to pale yellow flowers (18–32(–38) per inflorescence) with many more stamens (50–67) that greatly exceed the petals in length, and thinner, obovate to orbicular leaves that are recurved in the apical third. The two species have very different habitats and distributions with *K. montana* restricted to rocky slopes and outcrops within Stirling Range National Park.

Notes. The description here is based on only four specimens from the same immediate area, with only one specimen having fruit and seeds; if additional populations are located it is anticipated that there will be further variation in measurement characters.

Kunzea dracopetrensis does not key to any subgenus or section in Toelken (2016: 79) because the first couplet of the key to infrageneric taxa does not allow for the combination of 1–3-flowered inflorescences lacking a terminal tuft of leaves, seen in this species (or indeed others in sect. *Floridae*).

Identification. In order to accommodate *K. dracopetrensis*, the key to species and hybrids in subsect. *Floridae* (now sect. *Floridae*) in Toelken and Craig (2007) is modified as follows (modified couplets indicated by *; taxon numbering from Toelken (1996) and Toelken and Craig (2007) has been removed):

1. Ovary with 2 locules, each with 1 or 2 ovules; leaves club-shaped and with straight appressed hairs **K. eriocalyx**
- 1: Ovary with 5, rarely 3 locules, each with 6 or more ovules; leaf lamina linear, elliptic or if oblanceolate then $\pm$ flat and with tomentum varying, but if somewhat club-shaped then with $\pm$ coiled hairs
 - *2. Young leaves on long shoots hairy on both surfaces
 - *2A. Hypanthium and calyx lobes glabrous **K. dracopetrensis**
 - *2A: Hypanthium and calyx lobes densely hairy, at least when young
 3. Hairs on leaves and branches coiled
 4. Leaves club-shaped, (2.8–)3.5–6.4(–7.3) mm long **K. cincinnata**
 - 4: Leaves linear-elliptic, dorsiventrally compressed, 2.1–3.2 mm long **K. cincinnata** $\times$ **K. jucunda**
 - 3: Hairs on leaves and branches straight or irregularly twisted
 5. Ovary 3-locular; calyx lobes pointed; leaves glabrescent or less densely hairy adaxially than abaxially
 - 5A. Bracteoles 3.2–3.5(–3.7) mm long, hidden **K. similis** subsp. **similis**
 - 5A: Bracteoles 3.8–4.2(–4.4) mm long, apex exposed **K. similis** subsp. **mediterranea**
 - 5: Ovary 5-locular; calyx lobes bluntly acute to rounded and leaves with varying tomentum, but if the former pointed, then leaves $\pm$ densely hairy on both surfaces
 6. Hairs on adaxial surface of leaves shorter and fewer than on abaxial surface
 - 6A. Bracts shorter than half the hypanthium; leaf lamina linear-oblanceolate to club-shaped (0.5–)0.6–0.8(–1.1) mm broad; tomentum on branches and leaves appressed (strigose) **K. strigosa**
 - 6A: Bracts usually longer than half, and usually as long as, the hypanthium; leaf lamina oblong-elliptic to oblanceolate

- (0.8–)1.0–1.3(–1.6) mm broad; tomentum on branches and leaves loosely appressed (pubescent)..... **K. preissiana**
- 6:** Hairs on both leaf surfaces equally long and dense
- 7:** Bracts acute to acuminate, densely covered with spreading hairs; hairs on leaves and inflorescence 0.4–1.2 mm long
- 7A:** Leaf lamina (broader) (1.2–)1.5–2.2(–2.6) mm broad; calyx lobes acute to pointed..... **K. acicularis**
- 7A:** Leaf lamina (narrower) (0.8–)1.0–1.3(–1.6) mm broad; calyx lobes obtuse to rounded unless folded lengthwise..... **K. preissiana**
- 7:** Bracts rounded rarely with bluntly acute or mucronate apex, with hairs dense to becoming patchy and $\pm$ appressed; hairs on leaves and inflorescence 0.15–0.25 mm long..... **K. micromera** $\times$ **K. preissiana**
- *2:** Young leaves on long shoots glabrous on adaxial surface
- *8:** Calyx lobes acute to acuminate, rarely folded
- 9:** Hypanthium, calyx lobes and bracts glabrous..... **K. pauciflora**
- 9:** Hypanthium, calyx lobes and bracts hairy..... **K. acuminata**
- 8:** Calyx lobes bluntly acute to rounded unless folded
- *10:** Hypanthium and calyx lobes glabrous
- 11:** Young branches with long appressed hairs
- 12:** Leaf lamina linear; bracts usually beaked or acute..... **K. affinis**
- 12:** Leaf lamina elliptic; bracts rounded rarely mucronate..... **K. affinis** $\times$ **K. jucunda**
- 11:** Young branches glabrous or with a few spreading hairs..... **K. jucunda**
- *10:** Hypanthium and/or calyx lobes glabrescent (tomentum of calyx often varying from lobe to lobe)
- 13:** Bracts rounded, rarely mucronate; leaf lamina (1.5–)2–2.5(–3) times longer than broad..... **K. jucunda** $\times$ **K. preissiana**
- 13:** Bracts acute to acuminate to cuspidate; leaf lamina (3–)4–6(–8) times longer than broad..... **K. strigosa**

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